Appendix H
Notation

Symbol	Definition	Dimensions
a	Variable cross-sectional culvert area	ft^2
a_i	Discrete values for area, a	ft^2
A	Reference cross-sectional orifice area	ft^2
A_c	Reference cross-sectional culvert area	ft^2
A_L	Lock-chamber water-surface area	ft^2
A_p	Total port area	ft^2
b	Tainter gate opening (vertical)	ft
b_g	Sector gate opening (horizontal)	ft
B	Culvert height at valve location	ft
B_1	Culvert height in expanded section	ft
B_1^*	Effective culvert expansion height	ft
c	Slot discharge coefficient	none
C	Orifice discharge coefficient	none
C_c	Contraction coefficient	none
C_L	Overall lock coefficient	none
d	Draft of vessel	ft
d_e	Overtravel of lock water surface below lower pool	ft
d_f	Overtravel of lock water surface above upper pool	ft
dz/dt	Rate of change of the chamber surface elevation	ft/sec
D_c	Lock chamber depth	ft
D_h	Hydraulic diameter	ft
D_s	Sill depth	ft
f	Darcy-Weisbach friction factor	none
g	Gravitational acceleration	ft/sec^2
Δh_{a-b}	Piezometric head at location *a* minus piezometric head at location *b*	ft
h	Piezometric head; upper level referenced to the upper sill	ft
H	Water-surface differential (static pools)	ft
H_{Li}	Apparent loss of total head in system “i”. Note: intake (i=1); upstream culvert (i=2); valve (i=v); downstream culvert (i=3); outflow (i=4); remote segments (i=5); overall(i=t)	ft
H_m	Overall inertial effect	ft
k_i	Loss coefficient. Note: intake (i=1); upstream culvert (i=2); valve (i=v); downstream culvert (i=3); outflow (i=4); remote segments (i=5); manifold (i=m).	none

Symbol	Definition	Dimensions
k_t	Energy loss coefficient	none
K	Overall valve coefficient (not a loss coefficient)	none
L	Length	ft
L_m	Inertial length	ft
n	Number of valves used, 1 or 2	none
P_c	Culvert perimeter at the reference section	ft
Q	Flow rate; discharge per culvert	cfs
Q_T	Total discharge	cfs
r	Model scale ratio	
R	Reynolds number	none
t	Time	sec
t_e	Time at which the water surface reaches overtravel below lower pool	sec
t_f	Time at which the water surface reaches maximum overtravel above upper pool	sec
t_m	Time at which maximum rate of rise of lock water surface occurs	sec
t_v	Time at which valve is fully open	sec
T	Operation time	sec
v	Velocity in wall culverts through the full open valve	ft/sec
V	Mean velocity at the reference section	fps
z	Elevation	ft referred to datum
Z_l	Lower water-surface elevation	ft referred to datum
Z_r	Culvert roof elevation	ft referred to datum
Z_U	Upper water-surface elevation	ft referred to datum
Z(t)	Lock water-surface elevation at time *t*	ft referred to datum
α	Flow ratio	none
υ	Kinematic viscosity	ft^2/sec